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1917

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## UNIVERSITY OF ILLINOIS BULLETIN

ISSUED WEEKLY

Vol. XIV

August 13, 1917

No. 50

[Entered as second-class matter December 11, 1912, at the post office at Urbana, Illinois  
under the Act of August 24, 1912]

## Department of Household Science

Some Points in Choosing  
Textiles

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FIRST EDITION, 1910

FOURTH EDITION, REVISED, 1917



PUBLISHED BY THE UNIVERSITY OF ILLINOIS  
URBANA



## SOME POINTS IN CHOOSING TEXTILES

In the past century a great change has come about in the position of the woman in the home, which has very vitally affected her relation to the textile industries. In the early days in this country nearly every woman produced the household linens and the clothing for herself and her family, from the raising of the sheep or flax to the finished product. Now all is changed; with the introduction of ready-made suits and other garments, even the sewing is rapidly going from the home, while the manufacture of cloth is a forgotten art.

In olden times the quality of homespun and woven material was the best possible to be obtained from the materials and methods known. Woolen cloth was all wool, and linen cloth was not adulterated with starch or half cotton. Honest and durable materials were the rule of the day.

With the introduction of machinery and the factory system came keen competition. Modern discoveries, chemical and otherwise, have increased the possibilities of cotton, linen, silk, and wool so that now it is difficult to recognize the original fiber in some of the materials sold.

Thus, on the one hand, the field of textile knowledge has grown very much, while, on the other hand, the knowledge of women concerning textile fabrics has decreased, since women are no longer the makers of cloth, nor do they always gain a knowledge of its characteristics thru the making of garments. The result has been that they depend more and more on the word of clerks, who are often as ignorant as themselves, until by painful experience the buyers learn some of the things to be avoided.

As the cost of living and the demands upon the family purse increase, it is more and more important that the woman of the household should know how to spend the family income most economically. Since from ten to twenty percent of this income is spent for clothing and house furnishing, it is imperative that more thought and careful study should be put upon this branch of household economy. The object of this bulletin is to give some bits of information about textile fibers, their manufacture and adulteration, which may help in gaining that judgment in buying essential to every woman.

Certain adulterations and devices of the modern manufacturer are so skilfully concealed as to be detected only by the use of chemical tests or the high power microscope. This bulletin will deal only with those qualities and adulterations which may be detected without the aid of laboratory equipment. Much of course may be learned by

experience, but it seems better to save time and money by knowing beforehand what is to be demanded, what guarded against.

Each one of the common materials used for textile fabrics, cotton, linen, wool, and silk, has its characteristics, each its definite uses. Certain peculiarities in physical or chemical nature make each fiber peculiarly adapted to certain uses, but, so long as these general qualities are maintained, the variety of materials produced from these fibers may be enormous. Combinations of fibers in one material, adulteration with cheaper fibers or with starches or metallic salts, may serve to reduce the cost, and yet the purpose of the material may be fulfilled. For certain purposes the materials may be used interchangeably.

## COTTON

Cotton is cheap and very plentiful. It has short, flat fibers with a spiral twist, thus giving elasticity and the possibility of being spun into fine thread. Being in itself very useful and inexpensive and capable of replacing, to a certain extent, any other fiber, it is used in very large quantities the world over, and is manufactured into a great variety of materials. The quality of these materials depends on the strength of the fibers, the fineness or coarseness of material, the weave, the color and design, and the adulterations.

Cotton, being cheapest, is not adulterated with any of the other fibers mentioned when the material is to be sold as cotton cloth, but it can be made to appear heavier by the addition of mixtures called sizing. Starches, gums, dextrine, glue, china clay, as well as other ingredients in varying proportions, constitute this sizing, which may add a large percentage to the weight of the cloth. The spaces between the threads are filled up and a good finish is given to the cloth, altho the wearing quality is not increased. If the sizing is present in large quantities, the cloth is greatly reduced in weight and firmness after the first washing.

Adulterations of this kind can be detected by the feeling, a large quantity imparting a harshness to the material. In very thin fabrics the sizing may often be detected by holding the cloth up to the light, when the starch shows between the threads. Washing or thoro boiling of a sample will show the amount of sizing present.

Another method of adulterating cotton is shown in certain kinds of dotted swiss. A good swiss has thread dots woven or embroidered in the cloth. Figure 1A shows a piece of material sold at the price of a good swiss, but in this case the dots are merely a heavy paste, printed on the cloth. Figure 1B shows the result of continued washing, the dots having disappeared, and Figure 1C, the result of ironing with a hot iron, which turned the spots brown before the cloth itself was harmed.

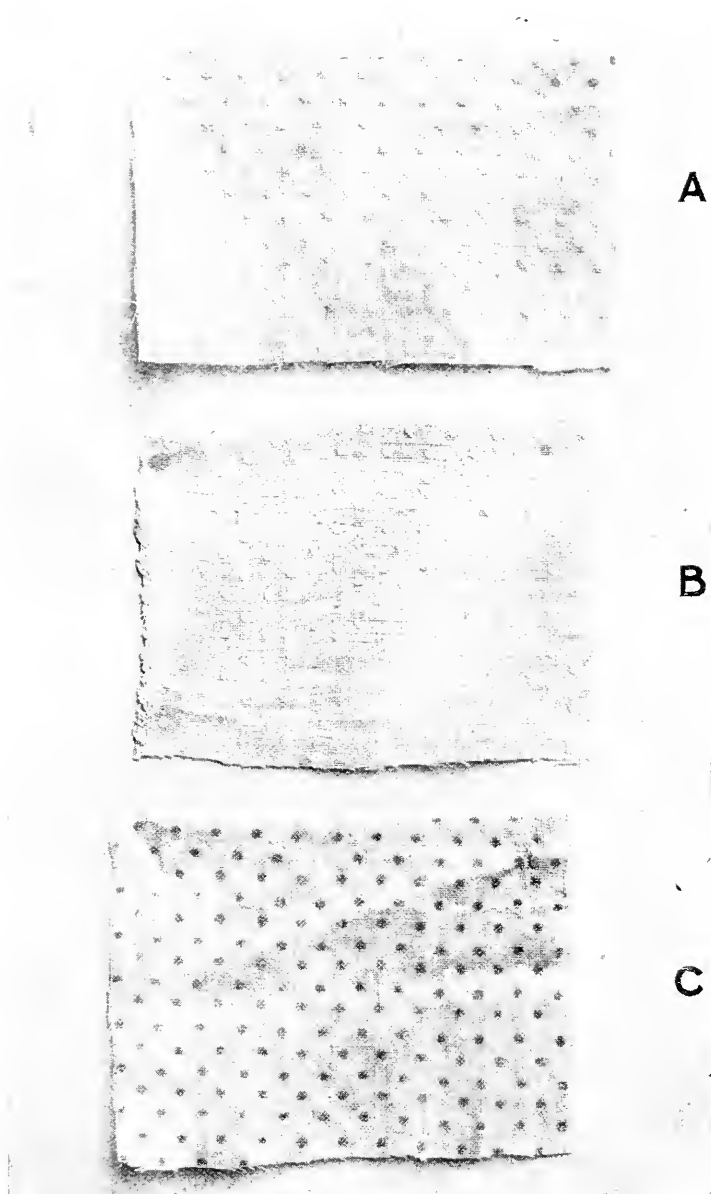


FIGURE 1

Mercerized cotton is a cloth produced by the action of a strong alkali on cotton fiber rinsed under tension. It is a strong, attractive material with good wearing qualities. An imitation of this may be made by the action of very heavy and very hot cylinders on ordinary cotton cloth. The mercerized cloth has a high luster which it retains after many washings, while the imitation loses its luster with the first washing.

Sometimes cotton cloth which has been on the market for some time is weakened by the action of the chemicals used in bleaching, dyeing, or sizing. This may be detected easily by tearing the cloth.

Standard cotton materials, such as muslins, organdies, percales, calicoes, and sheeting, differ only in the weight of the material, fineness of thread, hardness of twist, and method of finish. Gingham has the thread dyed before weaving and frequently fancy weaves are used. Duck, denim, and some other heavy materials have very hard twisted threads and often are woven with a twill. Silkolene is a trade name for a fine cotton cloth with a silky finish given after the cloth is woven.

Mercerized cottons make lustrous materials such as poplin, imitation pongee, and numerous attractive house furnishing materials.

India linen is entirely cotton, as is outing flannel and canton flannel. The two latter have a fleecy surface on one or both sides.

Many tussahs, voiles, economy linens, and other materials with rather deceptive names are cotton materials made to imitate silk, wool, or linen.

## LINEN

Linen was formerly the most important vegetable fiber and was used commonly for all household purposes. Of late years it has been replaced largely by cotton, with which it may be compared, altho there are still uses for which we demand linen, and others for which we prefer linen to cotton.

The linen fiber is long, smooth, and quite lustrous when spun into a thread. It is very strong and does not have so many fuzzy ends as are found in cotton. Cloth made from it is not only lustrous and rich looking, but because of its smoothness stays clean longer than cotton. The snowy whiteness of linen, obtained with some difficulty in bleaching, is quite permanent, and since the fiber takes dyes with difficulty and parts with them quite readily, it also does not retain stains as persistently as cotton.

Linen is much more expensive than cotton, and when linen prices are paid, linen should be demanded. Since the two fibers are rather hard to distinguish, especially when heavily starched and given a good finish, it is quite easy to deceive the buyer. "Linen" collars are frequently largely cotton, "linen" handkerchiefs may not have a



thread of linen, as is apt to be the case with rather inexpensive embroidered handkerchiefs, and table "linen" may be mercerized cotton, cotton and linen, or even ordinary cotton.

To distinguish linen from cotton, examine the threads carefully. Cotton is made up of short fibers which project from the surface of the thread and become fuzzy when the thread is rubbed between the fingers; when broken, cotton has a tufted end, while the linen fibers break more unevenly and leave a more pointed end. The linen thread should be stronger than the cotton; it has more luster and is usually more uneven. Some kinds of linen have flat threads, but cotton is frequently finished in imitation of flat thread linen.

The old test of moistening the finger and putting it under the cloth is not always a sure one, as the moisture will not come thru a heavy linen, or one with much starch in it, and it will come thru a sheer, tightly twisted cotton. A better test is to put a drop of olive oil on the cloth and press between blotting papers. The linen becomes more transparent than the cotton.

There is a peculiar leathery feel about good table linen which cotton will not give, and the luster is different altho the difference is hard to describe.

The typical weaves used for linens are as follows. The damask, satin, or sateen weave used for table linens and towels is especially good for the former because of the very smooth lustrous surface it affords, but not so good for towels as it does not absorb moisture very readily, altho it is very attractive. Huck, an uneven weave, giving a good surface for the absorption of water, makes splendid towels, and, decorated with designs in damask weave, may be very handsome. Many linens in plain weaves are available for clothing, embroidery, etc., while the coarse Russian crashes are becoming quite popular for decorative purposes.

The texture of linen is such that the heavier kinds hang well in folds, lie flat on a table, and are very artistic for many purposes.

## WOOL

Wool, the second fiber in amount used for clothing, is an animal fiber and differs greatly from the vegetable fibers discussed. Wool from the sheep's back differs from hair of goats or other animals in several ways. Wool is very curly and possesses a scaly structure in a much more marked degree than hair, in which the external scales lie flat. The surface of wool has sometimes been compared to a pine cone, or to the scales of fish, altho these two are quite different. The scales on the wool fiber when moist and warm stand up, more as the pine cone, and when cold and dry or cold and moist, lie flat. This peculiar structure of the surface of the wool fibers gives them the property of felting, or matting very closely together. Wool is also quite elastic, altho it has not great strength.

Since the demand for woolen cloth far exceeds the supply of new wool, there are many devices for making the supply go a long way, and consequently many methods for deceiving the buyer. In adulterating a material, the manufacturer seeks a material cheaper than the fiber he wishes to adulterate and one which can be concealed readily. Wool when combined with the cheaper cotton fiber makes a material which wears well, but does not keep its shape as well as all-wool cloth, is less warm, and should of course demand a lower price than all-wool.

Because of the felting property of wool, it is quite possible to conceal a good deal of cotton under the surface of the woolen cloth, and when the fibers are mixed before the threads are spun, the task of detecting them becomes doubly difficult.

## WOOLENS AND WORSTEDS

Two classes of cloth are manufactured from wool. Woolens are made usually of short wool carded and spun into yarn in which the fibers lie in all directions. This is woven into cloth which usually has the surface heavily felted, so that all of the intersections of threads in weaving are covered. Here, then, is splendid opportunity for adulteration, since cotton or poor wool may be covered up by the surface felting.

## WORSTED

The other class, worsted, is made from longer staple wool, combed and drawn until the fibers are parallel, then hard twisted. When woven, the ends of the fibers do not project on the surface, and the finish is not intended to cover the weave, hence it is more difficult to adulterate unless entire cotton threads are woven with the worsted, and these are more easily detected than a mixture of cotton and wool, or shoddy in woolen cloth. Common examples of woolens are flannel, broadcloth, and venetian cloth; of worsteds, serge, challie, men's suitings, and voile. Mohair is a worsted cloth woven of the wool of the Angora goat, with a warp usually of cotton or silk.

The most reliable tests for a mixture of cotton and wool are chemical or microscopic, but as these are not practical for the average buyer, others must be sought. Wool has luster and kinks; the ends of the threads are stiff and look rather wiry. When a sample is carried home, burning will serve to distinguish between the two. Wool burns slowly, chars, has an odor of burnt feather, goes out easily, and leaves a crisp ash; cotton burns quickly with a flame, with little odor, and leaves no ash.

A little practise in breaking the threads will help one to distinguish between the two; the difference is not one that can be easily explained, but the experienced housewife knows it well.

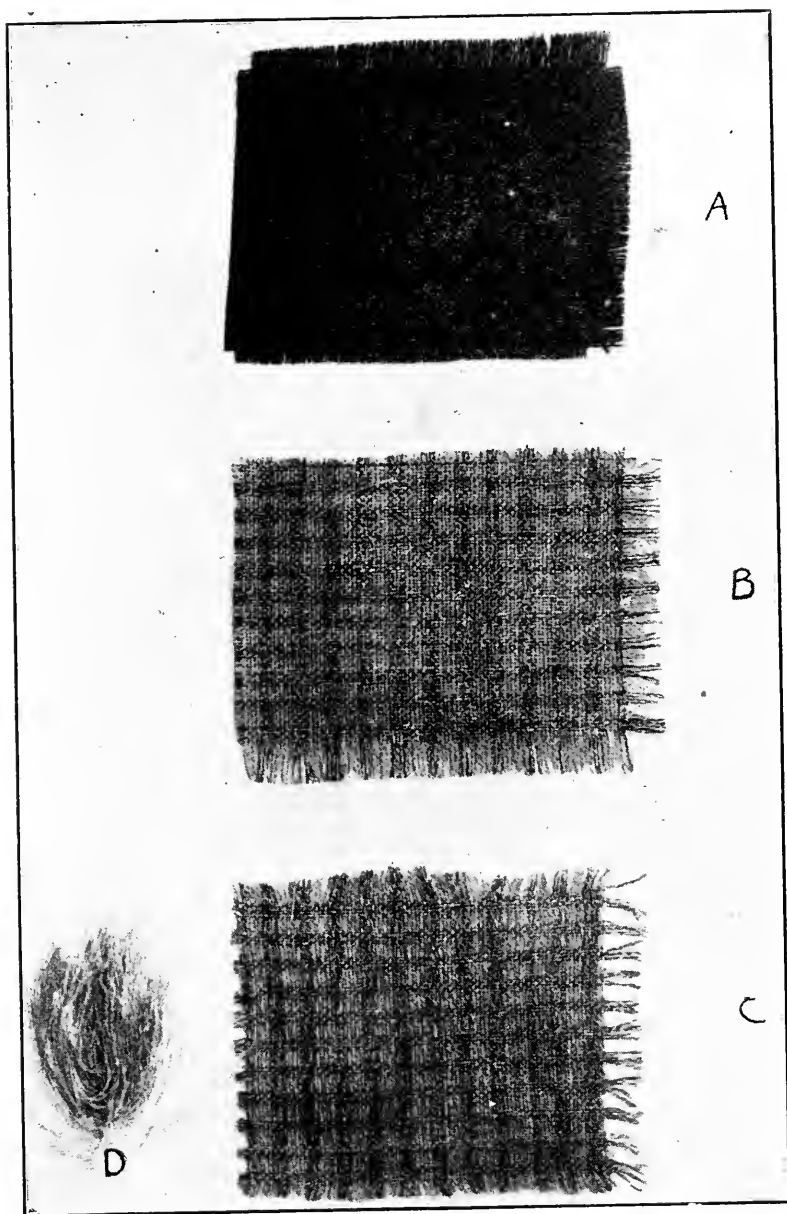


FIGURE 2

Figure 2A shows a sample of all-wool cloth, of the class of worsteds which cost seventy-five cents a yard. Figure 2B shows a sample of cloth of the same price, called by the clerk, all-wool, but which on examination was found to have only four threads of wool to every twelve threads of cotton. Figure 2C shows this same cloth with the wool removed by a strong alkali, caustic potash, leaving the cotton. Figure 2D shows the wool left when the cotton has been ravelled out or has been removed by a strong acid solution.

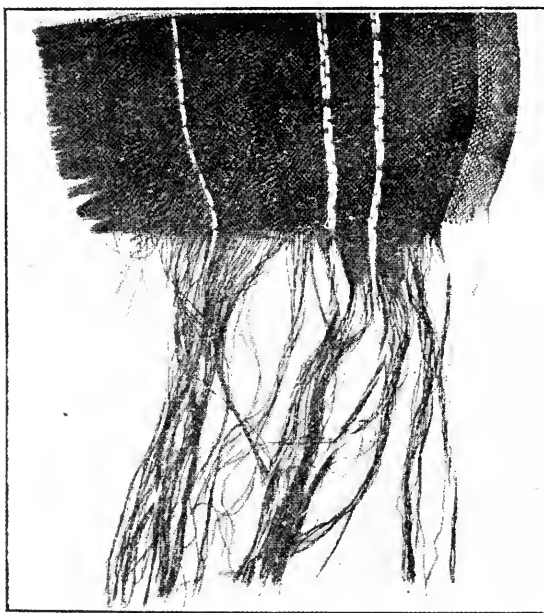


FIGURE 3

Figure 3 shows a sample of mohair in which the wool has been partly removed, and the cotton warp left. In this case the price is not high, and, because of the character of the cloth, the mixture is a good one, light, smooth, and clean. This cloth is not sold for all-wool, so is not considered adulterated.

### SHODDY

As has been said before, the demand for woolen goods is so much greater than the supply that it is necessary to resort to various measures to increase the supply of cloth. One method is to use the wool over and over again. Rags are bought up by the rag man, sold to the larger dealer and then to the "shoddy" manufacturer, who cleans them, sorts them, tears them to pieces, and uses the best all-wool rags

to produce fibers which are respun and again woven, either separately, if of very good quality, or mixed with new wool or cotton. Such a material is warm, looks well for a time, and has its place, but must not be bought for new wool, or demand the price of good woolen cloth. This industry is enormous and shoddy is often found in expensive novelty materials as well as in cheap "all-wool" cloth. Because of the shortness of the fibers it may be detected readily when used alone, but in combination with good wool detection is more difficult.

One class of shoddy consists of very short fibers, clippings from the mills, which are worked into the surface of a felted cloth after it is woven. These short fibers after a time work out and are found in the bottoms of coats, inside the linings, etc., leaving the surface of the cloth thread-bare.

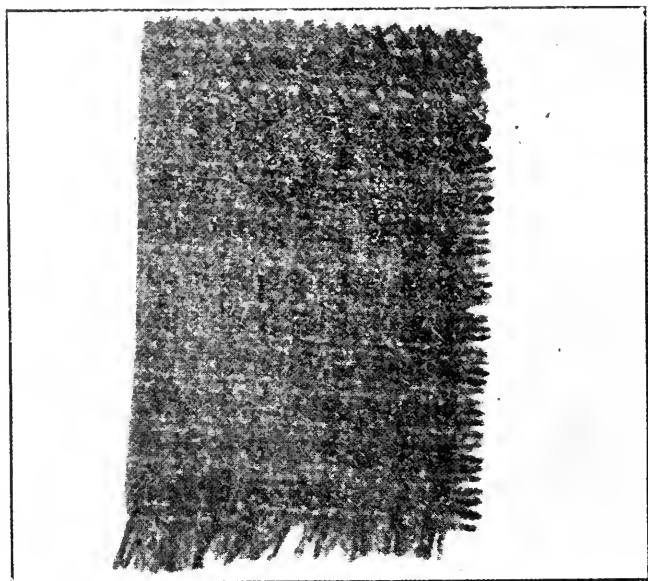


FIGURE 4

Figure 4 shows a piece of shoddy cloth, sold for all-wool at fifty cents a yard. This cloth would be warm, but does not look as well as more expensive cloth, and will not wear as long as new wool. There is some cotton mixed with the wool before spinning, therefore it is difficult to detect.

### SILK

Silk is frequently known as the fiber of luxury. It is the most expensive to cultivate, the most beautiful, and the strongest fiber.

Since it is the most expensive fiber to buy, and the demand for it is so great, the temptations to adulterate are also very great. The long, strong, lustrous silk fiber, which bleaches and dyes beautifully and is as fine as a spider's web, is not to be duplicated. The best grade or "reeled silk" is taken from the cocoon in one continuous thread, which may be several hundred yards long. In manufacturing reeled silk, many defective cocoons are found in which the fibers are not perfect, or are broken. The silk from these cocoons may be treated like a short fiber and spun into threads varying in strength according to the length of the fibers. This so-called "spun" silk has not the high luster nor strength of reeled silk, but it is often used as warp with reeled silk filling, or in imitation pongee, in the back of satins and velvets, and in many other ways.

In olden times the price of silk was much greater than now, but the material was much more durable. Silks which have been laid away for a hundred years are still in fairly good condition. Now our silks are much cheaper, and the result is that when they are put away, even for a few months, they may fall into bits, and their wearing quality cannot be compared with the good old silks of long ago. The reason for this change is not hard to find. The cost of raw silk is about thirty times that of raw cotton, and the waste at least five times that of cotton. The manufacturer must make up in some way if he is to sell silk at the prices demanded by the public.

Silk has a very great ability to absorb dyes and metallic salts without apparently changing the quality of the material, and since dyes and metallic salts are much cheaper than pure silk, the manufacturer makes great use of these materials. Loading is the common name for this process of treating silk, and it is common practise to add thirty percent of foreign material, just the percentage lost by the silk when the gum is removed, while it is possible to add two hundred and fifty or even three hundred percent.

When we buy novelties and do not care how short their life is to be, these heavily weighted silks answer the purpose very well, but when we wish for durability and the silk begins to crack and split or to become shiny after a few wearings, we realize the disadvantage of our modern methods. Practically no silk can be found on the market entirely free from loading, but there is a great difference in the amount present.

Burning is the simplest test for good silk; a thread of pure silk will burn slowly, leaving as it burns a very small amount of crisp ash in a ball at the end of the thread. Heavily weighted silk burns and leaves the ash in the form of the original thread; this ash of course drops to pieces readily. Figure 5A shows a piece of taffeta sold for one dollar a yard; Figure 5B shows the result of burning this silk. This ash, left in the shape of the original sample, is made up of

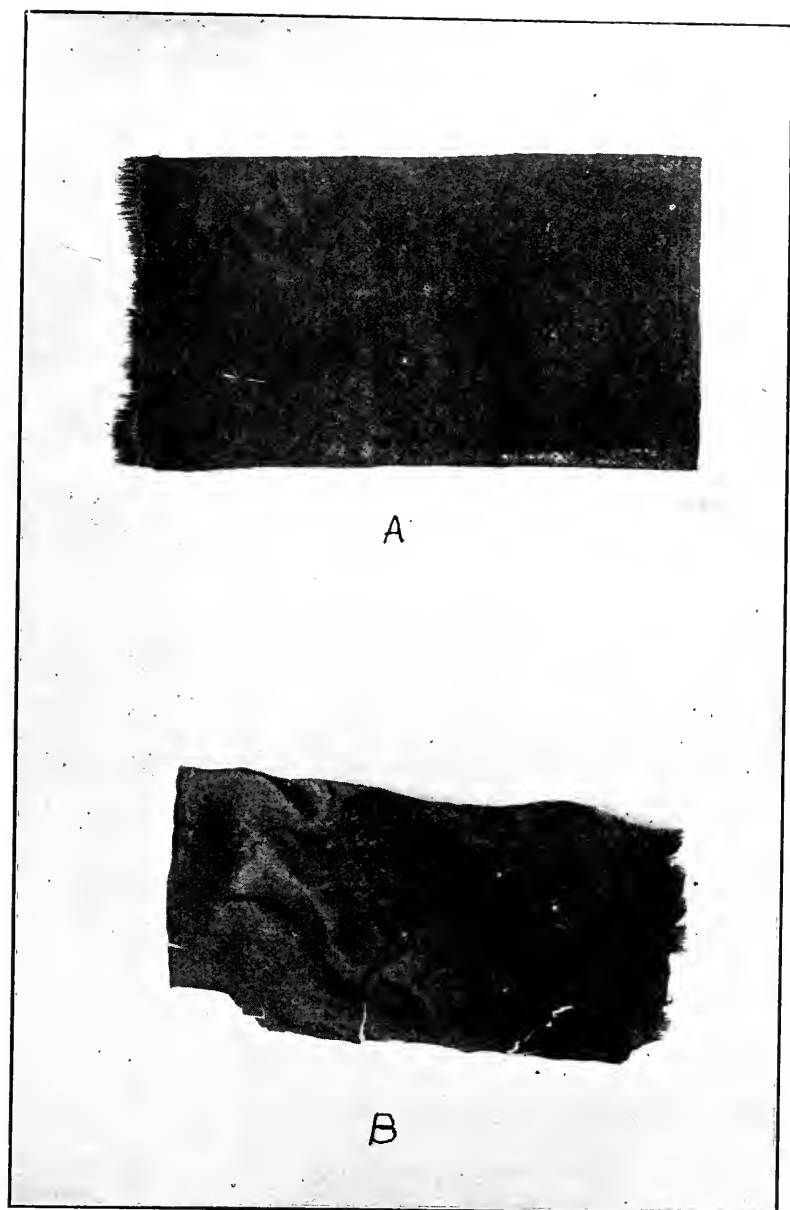


FIGURE 5

metallic salts, dyestuffs, etc. A very small percentage of ash would be left from the silk itself.

Another method of adulterating silk is with cotton. The fibers are not spun together, as the cotton and wool, but the threads of the two materials are woven together. In satins, velvets, and brocades, the cotton is entirely covered by the silk threads on the surface and appears as the back of the cloth. In cheap silks a fine cotton thread sometimes forms either warp or filling.

Pongee is a material made from the cocoon of the uneultivated silk worm; rajah, tussah, and other uneven, coarse materials are from the same source. These silks are very strong, but do not have a high luster. Mercerized cotton looks quite silky and is sometimes mixed with these silks, or a material of mercerized cotton and spun silk, or even one entirely of mercerized cotton, may be sold for pongee.

### ARTIFICIAL OR FIBER SILK

Altho silk may not be duplicated, modern science has developed a fiber which has rapidly found a place as a substitute for silk. Artificial, or fiber silk, as it is commonly called, is a solution of a preparation of cotton or wood fiber, so treated that after being put thru fine tubes it hardens upon being passed thru water. There is practically no limit to the length of this fiber, which has a high metallic luster and is strong. Material woven from fiber silk lacks the softness and richness of true silk, but is exceedingly lustrous with good wearing quality, is much less expensive than pure silk, and has many uses. Fiber silk may be distinguished readily from true silk by the metallic quality of its luster or by the stiffness of the fiber. Fiber silk burns very quickly, even more so than cotton, while true silk burns slowly. This fiber is not to be considered as an adulteration, but as a desirable product which brings within the reach of those with moderate means a material which combines beauty and wearing quality. It is woven alone or in combination with cotton or wool.

### RAMIE

A fiber commonly used in the Orient, but requiring too much hard labor in its production for wide cultivation in this country, is called ramie, or grass linen. In recent years, considerable ramie cloth has been brought to this country and has had some popularity. Ramie while resembling linen, has a more silky luster, but the cloth has less body and wrinkles even more easily than linen. Its chief popularity here has been in the form of oriental embroideries, doilies, and dresses, altho it is also sold by the yard in white and some few colors and in various weights of material. The silky luster makes ramie readily distinguishable from linen.



## JUTE

Jute, commonly known in string, coarse bagging, door mats, and the back of carpets, is also used in upholstery materials. The brownish tan thread made from this irregular fiber when combined with cotton, mercerized or not, or with silk, produces a very effective fabric. The difficult to bleach, and therefore used most commonly in its natural color, or dyed in dark colors, the best grades of jute may be bleached quite light. Pile fabrics woven of jute in a variety of colors are popular for carriage robes and sometimes are used for portières. Although not as durable as linen, jute, particularly in its unbleached state, has good wearing quality, and is less expensive than linen. The stiff woody nature and the color of the fiber distinguish it from linen.

## SUMMARY

### METHODS OF ADULTERATION

The adulterations most likely to be found and the tests for them are as follows:

1. By combination. Use of other fibers than the one indicated by the name of the material. Examples: cotton in woollens, cotton in linens, etc.

2. By substitution. Selling one fiber under the name of an entirely different one. Example: mercerized cotton sold for silk or linen.

3. By increasing the weight of a material. Examples: (a) cottons and linens with starch; (b) silks with metallic salts and dyes.

4. By giving a finish which is deceptive. Examples: (a) heavy pressing or calendering an ordinary cotton to imitate mercerizing; (b) finishing cotton to look like linen; (c) printing paste dots on cotton to produce the effect of embroidered dotted swiss.

5. By use of made-over yarns. Examples: shoddy in woollens, also addition of short wool, felted in surface.

### TESTS FOR ADULTERATION

1. Examination of cloth to see if all threads are alike, and to distinguish kind of thread.

2. Examination of individual threads.

Cotton: short fibers, ends appear fuzzy in thread.

Wool: short fibers, decidedly kinky and stiff.

Silk: long straight fibers with luster; spun silk, fibers short, thread looks more like cotton and breaks more easily than reeled silk.

Fiber silk: long comparatively stiff fibers with high metallic luster.

Linen: strong threads, high luster; when broken, ends are very uneven and straight.

Ramie: fiber with silky luster, threads stiff.

Jute: coarse, dark, woody fiber.

3. Burning tests: (a) cotton burns quickly with flame; (b) wool burns slowly, chars, and gives off odor of burnt feathers; (c) silk burns slowly, leaves small, crisp ash; when weighted, leaves more ash; d, linen, similar to cotton.

4. Linen, if without much starch, becomes translucent when treated with olive oil; cotton remains opaque.

5. A mixture of cotton and wool, when wet, wrinkles more than pure wool.

6. A careful examination of the finish of the material. Observe if alike on both sides, and if the apparent beauty of the material is due to finish or to good quality of fiber.

Finally, the best grades of material are generally what they seem to be, altho this does not always hold true in silks, nor in materials where the effect is more important than the wearing quality. Expensive broadcloths and table linens, worsted suitings, and good cottons do not pose for more than their true worth. It is when one turns to novelties, to silks, and to inexpensive materials, that one needs to be most vigilant. Be sure the inexpensive is not *cheap*, unless you wish a material cheap in wearing quality and appearance, as well as in cost.

## OTHER POINTS IN BUYING

Aside from the question of whether the buyer is getting the kind of material she pays for, as to character of the fiber, there are other things to be considered in choosing textile fabrics.

The weave affects the appearance and often the wearing quality of cloth. A close twill weave makes a firm, durable material, while the loose basket weave gives quite a different effect and frequently is lacking in firmness. The satin or sateen weave makes a beautiful surface, especially in linens or silks, but may cover up defects in the hidden threads. Fancy weaves in cotton novelties, shirt-waist materials, and fancy mulls, often leave loose threads which become soiled easily and may not be as attractive after washing. A cloth with a very heavy cross thread or filling and a very fine warp, or vice versa, may split because of the great difference in the strength of the threads.

Sometimes figures are woven in such a way that when the cloth is finished each figure has short ends of thread. For example, in weaving madras curtain material, the filling thread, which makes the figure, jumps from one figure to another, and after the material leaves the loom, the loose threads are cut off of the back of the material. Often these short pieces wash out or the ends become rough and fuzzy.

In choosing a material from the large variety on the market, determine first the use to which it is to be put, and then what is appropriate to that use. The cloth which is suitable for a street suit obviously is not suited to the party gown, neither are laces or dressy waists appropriate for working clothes. Clothes that are to be worn constantly need to be of material that will stand frequent cleaning. In materials used in house furnishing, certain ones must be cleaned often, and unless one can afford to pay frequent cleaner's bills, washable materials are better for curtains, bed-spreads, table-covers, etc. The cost is the next point to be considered, and necessarily that must be determined by one's purse. It is not always economy, however, to buy the inexpensive things, for, as we have seen, the inexpensive articles are more likely to be the cheap ones. With our desire for continual change, our love of novelty and fad, we have become very extravagant. So long as fashion demands new garments every few months, and women attempt to follow the styles, they must choose inexpensive materials unless they have a large amount of money and care nothing for wearing quality. In the end, however, the woman who buys carefully, makes use of conservative styles which do not change every few months, and chooses handsome material, is not only more economically, but also usually better dressed.

The hygienic properties of materials should be carefully considered. Those next the body should be able to care for the perspiration and the excretions of the skin. Woolen and silk are best suited by their physical structure to do this, but wool is too warm and too irritating to many people and does not wash well, while silk is too expensive. Many kinds of cotton underwear have been manufactured which, by their structure, aid in absorbing moisture. Underwear knitted or woven with meshes containing large enclosed air spaces is more hygienic than closely woven cotton garments. The air spaces in the mesh material are non-conductors of heat and are also ventilators. The closely woven garment does not allow a change of air next the skin and becomes clammy when moist. Garments which come in contact with the outside air must be more closely woven to keep out the wind. Two layers of lighter weight material are warmer than one layer of thick because of the non-conducting air between. Heavy clothes are bad for the body because of the extra load which must be carried about.

Finally, in choosing materials, if one is to have the greatest pleasure from them and give one's friends the greatest pleasure, color and design are very important. Colors should be suitable to the use and to the person who is to wear the material. Bright colors make one conspicuous and are exciting, dull ugly colors are depressing, while soft, rich colors are elegant, becoming, and in good taste.

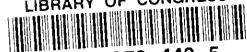
Designs should fit the place in which they are to be used. Rugs should be so designed that they serve as a background for the furniture of the room and also add richness in color and some variety. Materials which are to hang in folds should have designs which do not depend on smoothness of surface in order that they may be effective. For clothing, designs should be inconspicuous, modest stripes, dots, and plaids being most successful, except on very soft, thin materials, when larger and less conventional designs may be used.

To buy intelligently it is necessary, then, that a woman should know before she purchases a piece of cloth just where it is to be used, what she can afford to pay for it, and what she should be able to get for that amount of money, and then be able to tell whether the piece of cloth she buys is really what it is represented to be. At the present time, the rush to the bargain counter, the enormous amount of cheap, poor material manufactured, and the great waste in dress, all go to prove that there are many women who are not intelligent buyers.

When women demand a better quality of materials and refuse to buy cheap things, the manufacturers will cease to produce worthless goods. Perhaps, however, before that day arrives, the thoughtful workers of the land will have succeeded in passing a pure-textile law, which shall do for our cloth what the pure-food act is doing for our food supplies: then the honest tho ignorant buyer will be protected, but it will still be her part to demand good, artistic, and useful materials.



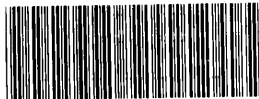
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